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ABSTRACT

This document reports the proceedings of a teleconference convened to acquaint vocational education leaders and the vocational education community with the federal guidelines for "tech prep" programs as well as the elements of successful programs. About 700 down-link sites from 48 states participated in the conference, with an etimated audience of some 10,000 persons. The following presentations were part of the conference: "Tech Prep Satellite Teleconference Introduction" (David Crippens); "The New Perkins Act and Tech Prep Education" (Winifred I. Warnat); "Tech Prep Development in Postsecondary Education" (James Dixon); "Tech Prep from the Consortium and Postsecondary Perspective" (Diana Walter); "Business and Industry's Role in Tech Prep" (Royce N. Angel); and "Factors Influencing Tech Prep Planning and Implementation" (Debra Bragg). (KC)

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National Center for Research in
Vocational Education

University of California, Berkeley

TECH PREP:
DEVELOPING COOPERATIVE PROGRAMS AND PARTNERSHIPS

NATIONAL SATELLITE TELECONFERENCE PROCEEDINGS

Inservice Education Project
Virginia Polytechnic Institute and State University

U.S. DEPARTMENT OF EDUCATION
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PREFACE

On October 29, 1991, the National Center for Research in Vocational Education (NCRVE) conducted a national satellite teleconference titled "Tech Prep: Developing Cooperative Programs and Partnerships." The originating site of the teleconference was Virginia Polytechnic Institute and State University in Blacksburg, Virginia. The purpose of the teleconference was to acquaint vocational education leaders and the vocational education community with the federal guidelines for Tech Prep programs as well as the elements of successful Tech Prep programs.

The teleconference objectives were to (1) describe strategies for developing successful cooperative programs, (2) discuss federal guidelines for Tech Prep programs, (3) present NCRVE research outcomes, and (4) describe the role of business/industry in developing partnerships.

About seven-hundred down-link sites from forty-eight states were participants in the teleconference with an estimated audience of ten thousand or more persons. The participants included secondary and postsecondary administrators and faculty in the beginning stages of developing Tech Prep programs, business and industry leaders interested in developing Tech Prep partnerships, teacher educators, and educational policymakers.

David Crippens, Senior Vice President of Educational Enterprises, KCET Public Television in Los Angeles, California, was the teleconference moderator. The five panelists included (1) James Dixon, Associate Principal, David Douglas High School, Portland, Oregon; (2) Diana Walter, Executive Director, Partnership for Academic and Career Education, Tri-County Technical College, Pendleton, South Carolina; (3) Winifred Warnat, Director, Division of Vocational-Technical Education, Office of Vocational and Adult Education, U.S. Department of Education, Washington, DC; (4) Debra Bragg, Project Director, National Center for Research in Vocational Education, Department of Vocational-Technical Education, University of Illinois, Champaign, Illinois; and (5) Royce Angel, Operations Manager, Southern Bell Telephone Company, Wilmington, North Carolina.

Susan L. Faulkner, Research Associate
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TECH PREP SATELLITE TELECONFERENCE INTRODUCTION

David Crippens, Teleconference Moderator and
Senior Vice President of Educational Enterprises
KCET Public Television
Los Angeles, California

Tech Prep is an innovative approach to education authorized by the 1990 Carl D. Perkins Act. The concept of Tech Prep places it in a pivotal role for true educational reform at the secondary and postsecondary levels. Tech Prep holds much potential to provide a true melding of real learning and work. To make this a reality, the following groups can play an important role in a consortia: students, education, business, labor, industry, parents, and community organizations.

To maintain our standard of living and competitive edge in the world economy, the United States must have the world's best system of education. Tech Prep can provide effective ways to motivate young people to achieve their educational goals. It can establish clear signals that education will have genuine value and offer positive consequences for effort and success.

The purposes of this teleconference are as follows: (1) we will acquaint you with the federal guidelines for Tech Prep programs; (2) we will describe strategies for successful consortia; (3) we will describe the roles of business, industry, and others in developing partnerships; and (4) we will provide some research findings from the National Center for Research in Vocational Education, University of California at Berkeley.

The driving force for all of us is this question: How can we educate all of our young people to ensure that they are contributing citizens? This teleconference was designed to be useful to you in planning and implementing Tech Prep programs. We will begin with presentations by our distinguished panel members and then spend most of the time answering questions from about seven-hundred down-link sites from forty-eight states. The number to call for questions is 1-800-222-9703.

Now, let me introduce our panelists. Winifred Warnat is Director of the Division of Vocational Technical Education, Office of Vocational and Adult Education for the United

States Department of Education. Her office is responsible for the administration of the nearly $1 billion of Perkins' funds distributed to the states.

Royce Angel is Operations Manager of Southern Bell Telephone Company in Wilmington, North Carolina. He is a volunteer in education and Vice Chair of the North Carolina Community College System Board.

James Dixon is an Associate Principal at the David Douglas High School in Portland, Oregon. His consortium with the Mount Hood Community College received one of the three Dale Parnell Tech Prep Awards given by the American Association of Community and Junior Colleges.

Diana Walter is Executive Director of the Partnership for Academic and Career Education (PACE) based at Tri-County Technical College in Pendleton, South Carolina. PACE also received one of the Dale Parnell Tech Prep Awards from the American Association of Community and Junior Colleges. In addition, PACE received the U.S. Department of Education's Excellence and Partnership Award for Tech Prep.

Debra Bragg is a Project Director for the National Center for Research in Vocational Education at the University of California at Berkeley, University of Illinois site. She also works with the Illinois State Board of Education in assisting them with their Tech Prep plans.

This teleconference is for you, and we hope that you will gain the information you need to make your programs successful. Thank you for being with us. Our presentations will begin with Winnie Warnat.

THE NEW PERKINS ACT AND TECH PREP EDUCATION

Winifred I. Warnat, Director
Division of Vocational-Technical Education
Office of Vocational and Adult Education
United States Department of Education
Washington, DC

Rapid advances in technology and heightened global economic competition demand increased technical skill levels of youth entering the workforce. The United States needs innovative strategies beyond the boundaries of traditional schooling to provide the knowledge and skills essential for building a world class workforce. The Carl D. Perkins Vocational and Applied Technology Act of 1990 (Perkins) responds to the changing complexities of the workplace through Tech Prep education, a cornerstone of the new law.

The new Perkins is a catalyst for change in vocational-technical education. The purpose of this law is (1) to make the United States more competitive in the world economy and (2) to develop a workforce with the skills needed to work in a technologically advanced society.

Tech Prep education, highlighted in Perkins, is one of the most significant innovations in the education reform movement and is the basis for major structural change in the educating process. Tech Prep provides a new and vital source of energy in vocational-technical education and one solution to workforce preparation in the United States.

In keeping with the President's education initiative, America 2000, Tech Prep education relies on community empowerment and partnerships and business involvement. As an alternative to the college prep course of study, Tech Prep prepares the student for entry into the workplace as a highly skilled technician or for continuation of education leading to baccalaureate and advanced degrees.

Tech Prep is a program of study available to all students: college prep, vocational, and general. It is also open to youth who are disadvantaged, minority, limited in English proficiency, handicapped, or dropouts. Tech Prep is for both male and female youth interested in pursuing technical careers.

Under Perkins, the vocational-technical education community has five years to show the success of Tech Prep--a short time, but it can be done!

Tech Prep education is addressed in two different segments of Perkins. It is mentioned first in Title II, Basic State Grants under Section 235, Uses of Funds. A Tech Prep program is identified as an allowable expenditure providing it meets three requirements as follows: (1) size, scope, and quality to be effective; (2) integration of vocational and academic education through a coherent sequence of courses; and (3) equitable participation for special populations. Tech Prep under Title II does not designate the design of the program.

Under Title III, the 2+2 Tech Prep design is specified. Tech Prep education receives major emphasis under Title III, Special Programs in Part E, Tech Prep Education. Two purposes stated are (1) "To provide planning and demonstration grants for consortia of local education agencies and postsecondary educational institutions for the development and operation of four-year programs designed to provide a Tech Prep program leading to a two-year associate degree or a two-year certificate" and (2) "To provide in a systematic manner strong, comprehensive links between secondary schools and postsecondary educational institutions." The level of funding by Congress for Tech Prep education determines whether or not Tech Prep under Title III is a national competitive grant program or a state grant program. First year appropriations are $63.4 million, making it a state grant program in which all states receive an allocation. If the appropriation had been under $50 million, Tech Prep education would have been a national competitive grant program. Grants given by the states to Tech Prep consortia must be equitably distributed between urban and rural participants.

Title III, Part E is prescriptive and quite specific as to the type of Tech Prep program to be developed. The Tech Prep approach emphasized is described as a 2+2 design encompassing the last two years of high school and two years of occupationally specific postsecondary education or apprenticeship that culminates in a two-year associate degree or certificate. It must emanate from a consortium made up of representatives of local education agencies, including intermediate educational agencies and area vocational schools and institutions of higher education, that offer two-year associate degrees or certificates including community colleges, technical institutes, and proprietary trade schools. Two-year apprenticeship programs are also included. A consortium must be a

combined secondary and postsecondary program based on a formal articulation agreement that provides students with a "non-duplicative sequence of progressive achievement leading to competencies in a Tech Prep program."

The law also specifies that the Tech Prep program provides preparation in at least one field of engineering technology; applied science; mechanical, industrial, or practical art or trade; agriculture; health; or business. The program is expected to build student competence through a sequential course of study in math, science, and communication which may be obtained through applied academics. Integration of academics into the Tech Prep curriculum is expected.

The Tech Prep education program presented in Title III of Perkins *must* have the following seven elements: (1) an articulation agreement between consortium participants; (2) a 2+2 design with a common core of proficiency in math, science, communication, and technology; (3) a specifically developed curriculum appropriate to the needs of the consortium participants; (4) joint inservice training of instructors to effectively implement the Tech Prep curriculum; (5) training programs for counselors to recruit students and ensure program completion and subsequent appropriate employment; (6) equal access of special populations to the full range of Tech Prep programs; and (7) preparatory services such as recruitment, career and personal counseling, and occupational assessment. In addition, the Tech Prep program may seek technical assistance from successful Tech Prep programs and acquire equipment as part of program planning.

Priority consideration should be given to Tech Prep programs that (1) offer effective employment placement; (2) transfer to four-year baccalaureate programs; (3) are developed in consultation with business, industry, and labor; and (4) address dropout prevention and reentry and the needs of special populations.

With the emphasis given in Perkins, Tech Prep education is breaking new ground in providing quality education for the preparation of a quality workforce. Tech Prep stimulates new organizational and programmatic arrangements. It requires strategic thinking and planning and a level of cooperation and collaboration that can only be accomplished through effective teamwork. Most importantly, Tech Prep education provides our youth with a highly desirable pathway that works for them and the nation's economic well-being.

TECH PREP DEVELOPMENT IN POSTSECONDARY EDUCATION

James Dixon, Associate Principal
David Douglas High School
Portland, Oregon

Most of us who are involved in education look for ways to provide additional opportunities for our students. When we can identify ways to do this, we often find ourselves on a crusade to see that the opportunity becomes a reality. One of the pitfalls to this is the difficulty of getting others to see things the same way we do. No idea can become successful without all those involved buying into the program.

Vocational directors in our area have been meeting for years, and one of the often discussed topics has been finding more and better opportunities for students. Specifically, we have discussed the issue of making better use of the community college in assisting our students in getting into careers with suitable training. We have been working with the community college in many areas, but until we developed our consortium, we had not yet developed a relationship that would provide for our vocational students in a meaningful way.

In 1986, the opportunity to provide services came when some of the Perkins money was made available to regions of the state to form consortiums and concentrate on the improvement of vocational programs. A consortium composed of representatives from Mt. Hood Community College, seven cooperating school districts with eight high schools, the Mulnomak Educational Service District, JTPA, Project YESS, the Oregon State Employment Service, the Apprenticeship council, and various business and industry interests was formed. In the beginning, only Perkins money was available to the consortium. Since then, Oregon Workforce 2000 funds have also been added to assist our improvement projects.

Our first problem was to appoint representatives to the consortium steering committee. An effort was made to get districts to appoint members who could represent the districts in the decision-making process. Different districts responded in different ways, and the end result was a committee including everyone from an assistant superintendent to a classroom teacher. Oddly enough, this combination worked well and accomplished much.

In addition to being empowered to make decisions, the members needed to be committed to the process and willing to spend the time necessary for success. One strong point in our committee has been consistency. Even when someone has left the committee, there has been time to bring the new representative up-to-date prior to the old one leaving. Consistency has enabled the committee to accomplish much more than they would have if they had had to train a new person with no prior background.

At an early meeting of the consortium steering committee, the president of the community college came before the group and pledged his support for our efforts. He viewed what we were doing was important. He later met the superintendents of the school districts and provided them with his views on the consortium efforts. Again, he was very positive, and all of the superintendents have been positive influences as well.

We felt the need to develop a rationale, not only to provide the committee with a direction, but to enable others to see where we were headed. The elimination of redundancy between high school and community college courses and the addition of more high technology training were considered to be of prime importance. In addition, by placing students in advanced classes at the community college, program completion would take less time and graduates would achieve high skill levels. All of these issues were deemed important to provide a better program of study, a potential for a better trained workforce, and an opportunity for students to move through a program successfully in as little time as possible.

A number of tasks were identified, but because it was not possible to begin all programs at once, it was necessary to determine which programs would be chosen for the first implementation. As the Tech Prep program evolved, operating procedures and guidelines were defined and a general agreement between Mt. Hood Community College and the secondary schools was prepared. Various administrative questions arose, some specific to only one district; and those were resolved by representatives returning to their district for solutions. Problems that arose were resolved as we went along, so they did not continue beyond the developmental stage. It was also essential that we coordinate policies and practices among sectors of the educational community. Finally, it was necessary to provide a mechanism for evaluation of the program as we finished one phase and entered the next.

It became evident early in the process that we needed a coordinator, someone with the knowledge of what we were attempting that had the time to pursue the interests of the consortium between meetings. We were fortunate to have the services of the Regional Vocational Coordinator to research issues, make contacts for specifics with the districts, and take on the many other duties that made us successful. This person was responsible for the organization and follow-through of the many meetings held with and for teachers.

Having everyone on board when developing a program, the school district superintendents, community college president, high school principals, and other administrative staff were kept advised about our plans and progress during all planning stages. Without the support of these people, we would have been unable to accomplish our goals. Administrative staff also needed to know what would be affecting them and their programs. Every effort was made to keep them informed, and the lines of communication remained open in both directions.

The teachers at both the high school and the community college were important in anything we managed to accomplish. They needed to work together if they were to work out the problems of such an undertaking. They needed to develop and coordinate courses that would relate to project goals. Courses were evaluated, modified, and reorganized based on content and the curriculum had to be rewritten. Programs that would work in each individual school were designed and course-by-course agreements prepared. To accomplish these tasks, meetings of teachers from the high schools and the community college were held. As these teachers worked together, they not only resolved problems but got involved and developed a real ownership of their program. They became another key to selling the program to the administration, the other staff, and the students.

Because of the newness of the program, the counselors were to play an important part in success. They were in need of information and training so they could offer the program to the students to meet their career needs. Because the program offered new opportunities, the counselors were enthusiastic and this enthusiasm was reflected in student involvement.

Since students would be moving to the community college in a nontraditional manner, it was necessary to work with the admissions and records personnel at the

community college. The registrar was also a key player to this process and served an important role in keeping records in agreement between the two institutions.

The idea of providing high school students with an opportunity to earn college credit was not a new concept. We had already been doing just that with academic courses for a number of years. What was new in this program was a change in the type of students involved and the concept that while they were still in high school, they could embark on a planned program that would culminate in a degree from the college. The Tech Prep articulation built a realistic bridge between the high schools and the community college.

Because of constant communication with school administrators during the developmental stages, the finished product was totally sellable. We had solved many problems (i.e., cost to the districts, transportation problems, territorial rights). Now it was time to put the idea to the test. The program was explained in full, approval was received, and agreements were signed. Even though some people still had doubts, we implemented the program. As more students have become involved, doubts have disappeared and new programs have been added.

Now that the program was off and running, it was time to move ahead to keep the momentum. We continued pulling the community college and high school teachers together for the development of curriculum and agreements in additional areas, developing teacher activities as they developed a close bond and began to get more creative, developing the process of evaluation, revisiting and rewriting of the curriculum, and reviewing and endorsing agreements on a yearly basis.

The steering committee of the consortium was also kept active evaluating existing programs and continuing to look for improvements in the current programs. They also expanded their direction and began to look at other programs. This sharing of information about programs is now in place, and the search continues to identify more possibilities.

Among the obstacles we ran into was the problem of turf in curriculum decisions, credit, and teacher prerogatives. Turf problems were eventually worked out among the teachers as they met to discuss and plan. The other major problem was the amount of time consumed in the process of putting together such a program. Many hours were spent by the consortium steering committee and the teachers to bring the vision to fruition.

A myriad of small accomplishments exist that lead to our success. Perhaps one major accomplishment has been the cooperative efforts that have come from the venture. While still maintaining our individual identities, we look for better ways to work together. Another major accomplishment is the many agreements in the Tech Prep areas, with more possibilities coming to light regularly. Finally, the relationship with Mt. Hood Community College has become a real partnership. They have worked with us in every way and have provided advice, leadership, time, facilities, and clerical assistance. This is a major commitment from them, and we have learned to work well together.

This is not a panacea to solve all problems. We are fortunate to have a group of people who have been able to work together toward solving common needs in some areas. It is not a resolution of all of today's educational needs, but it does work toward that end. If this process is to work, it requires hard work, commitment, and vision.

TECH PREP FROM THE CONSORTIUM AND POSTSECONDARY PERSPECTIVE

Diana Walter, Executive Director
Partnership for Academic and Career Education
Tri-County Technical College
Pendleton, South Carolina

The Partnership for Academic and Career Education (PACE) is a business and education consortium involving Anderson, Oconee, and Pickens Counties of South Carolina. The tri-county region is predominantly rural and is located in the northwestern corner of the state.

The PACE Consortium was officially formed in May of 1987, after almost a year and a half of discussion between the seven school superintendents, business and community leaders, and top administrators of Tri-County Technical College. These individuals originally came together because of the interest and efforts of Dr. Don Garrison, President of Tri-County Technical College, who was inspired by the ideas and theories presented in Dale Parnell's book, *The Neglected Majority*.

The PACE Consortium currently involves seven school districts, Tri-County Technical College, the National Dropout Prevention Center, the Anderson County Business and Education Partnership, the College of Education at Clemson University, and five area businesses representing manufacturing/technical industries, health care, public service, and retail businesses. The seven school districts belonging to the PACE Consortium involve sixteen high schools, one of which also serves as a career center offering secondary vocational programs and three other career centers. One of those centers, called The Career Center, serves two of the five Anderson County districts, and because of its unique situation, is represented directly on the PACE Coordinating Board.

The Consortium functions with a Coordinating Board involving all seven school superintendents, the president of Tri-County Technical College, directors and others in key positions representing the various partner agencies. The Board sets general policies and provides overall leadership for the area's Tech Prep initiative. The current Board chairperson is Dr. Karen Woodward, Superintendent of Anderson School District Five.

PACE works with counseling and curriculum committees that involve representatives from the schools, the College, and the business community. The

Consortium functions with a four person administrative staff including three full-time staff persons. I serve as the executive director. PACE also has an associate director/curriculum developer, and an administrative assistant. In addition, we have a half-time counselor/industry liaison who also works half-time for the College as the director of cooperative education. Programmatically, the staff reports to the PACE Coordinating Board; organizationally, we report to the president's office. The staff offices are located on the Tri-County Technical College campus.

Since PACE was formed in 1987, we have gone through several phases trying to settle on a definition and implementation approach for Tech Prep that fits the needs of our schools and our communities. We started under the title "2+2/Tech Prep/Associate Degree" where the focus was to link grades eleven and twelve with associate degree programs. Our schools had concerns about that approach because they felt waiting until grade eleven was too late, especially to have much impact on at-risk students. Also, in the first phase, we had little or no emphasis on traditional vocational education programs because our target group was only those students enrolled in general education programs.

In the second phase, we used the title "Tech Prep/Associate Degree" which focused on the development of four career tracks, or pathways, starting in grade nine and ending with the associate degree. Our thinking was to implement applied academics for each career cluster and develop new general technology courses that would be more concept-based than skills-based. The major problems we faced were the costs involved, concerns about students being too locked in, and counselors' concerns that students and their parents would be resistant to choosing a career cluster track at the end of grade eight.

During late 1988, we moved into phase three which is where we are today. We use the title "Tech Prep: PREParation for TECHnologies" which involves the development of one comprehensive program option focusing on several key components. These components include adding new applied academic courses; enhancing existing courses through local curriculum development activities that incorporate real-world examples in the teaching of math, English, and science; blending academic and occupational courses so students develop a base of technological skills in high school; emphasizing the involvement of the local business community; improving counseling and career focused activities; involving middle and junior high schools in developing a smooth transition into the high school curriculum and developing better career understanding activities; articulating

appropriate secondary and postsecondary courses to eliminate curriculum overlapping; and developing support components and incentives to help students stay in school.

The basic definition we use for Tech Prep is that it links high school and two-year college programs. It eliminates the gaps and the overlaps between these two levels of education and provides occupational and academic preparation for mid-level technology careers in four cluster areas: industrial and engineering technologies, business technologies, health technologies, and human/public service technologies. We define mid-level technology careers as those that require some vocational training up to and including an associate degree to enter the job field and/or to qualify for advancement.

The goals of our Tech Prep initiative are fairly simple and include (1) lowering the school dropout rate; (2) increasing students' academic skills and their abilities to pursue postsecondary education or to enter meaningful employment directly after high school graduation; (3) increasing the number of students who choose to enter postsecondary education at the associate degree level; (4) increasing tuition assistance opportunities through co-op, employer-assisted tuition and other programs; and (5) increasing the numbers of college graduates in occupational associate degree programs as a way of increasing the number of skilled employees to support our area businesses.

PACE uses an individualized approach to program development and implementation. Tech Prep in our area has been, and continues to be, a bottom-up initiative shaped by teachers, counselors, principals, district and college administrators, business people, and others. In our approach, each site has its own coordinator or contact person and its own planning team. In many cases, the PACE staff participates with those site-based planning teams. Each site also utilizes the Consortium staff for resource and technical assistance and participates in the Consortium communication networks to share products, discuss problems and solutions, and identify new development activities. The Coordinating Board sets general goals and objectives for the Consortium, but each site determines how best to approach implementation. In the PACE program, all decisions affecting curriculum and other development activities are made through existing structures and processes, both on the secondary and postsecondary levels.

This flexibility in development and implementation has been extremely important and has resulted in a comprehensive vision of what Tech Prep should involve. We now look at Tech Prep as a concept which involves a number of components all working

together. Two of the key components are curriculum and counseling. In terms of the secondary curriculum, the focus is on enhancing skills using a real world, applied approach or blending applied course offerings and traditional college prep courses.

Our schools have implemented a number of new applied courses, but many have also begun local curriculum development activities to enhance the entire math, science, and English sequences. The PACE staff coordinates curriculum teams involving local business people to develop supplemental materials for applied academics using examples from area companies. In addition, the Consortium has helped develop mechanisms enabling local business professionals to address student groups and to increase students' understanding of mid-level technology career opportunities in the tri-county area.

In terms of the postsecondary curriculum, we have not made changes in entry-level courses because of the current focus on closing the academic skills gap between the old general education curriculum and the postsecondary curriculum. We have, however, discovered a way to change the postsecondary curriculum through the development of Advanced Technology Certificates that would enable Tech Prep students to graduate with skills beyond the normal scope of associate degree programs. By combining the advanced placement component of Tech Prep with advanced technology certificates at the end of the associate degree, students will be able to graduate with two postsecondary credentials in the time it would normally take to finish an associate degree. We have completed the curriculum outline for one certificate in Machine Tool Technology and have begun work on a second certificate in Office Systems Technology.

Another key component in our approach to Tech Prep is an enhanced role for guidance and counseling. Many activities have been initiated in our area to support the guidance function. For example, many of our schools have begun coordinated guidance activities between high school and middle/junior high schools to help students better understand the Tech Prep program and related career opportunities. Also, several schools and the college have expanded their career resource collections to emphasize mid-level technology careers and have initiated staff development programs for counselors. One particularly important activity for counselors, although not limited to counselors, has been a Summer Institute offered through the Consortium each year since 1987.

As a result of the Tech Prep initiative, counselors in our area have seen a need for more and improved materials geared toward the Tech Prep concept. The PACE staff works

with all schools to develop career planning guides and promotional materials and to provide better information on careers, job trends, tuition assistance opportunities, and outcomes of associate degree programs. In recent years, the Consortium staff has been especially involved with area companies in providing schools with local information on careers, job requirements, and the skills employers seek in new employees.

Another key element in guidance has been to help students identify a clear focus for their high school studies while helping them and their parents see that there is flexibility in the Tech Prep program. Therefore, our approach emphasizes students entering high school with an understanding of mid-level technology careers and then experiencing a challenging curriculum of academic and occupational study which provides opportunities for advanced standing at the postsecondary level. Counselors work with students and parents to explain the students' three postsecondary options. The student can (1) enter the workforce with appropriate academic and occupational skills, (2) enter a two-year college program with advanced standing, or (3) begin a university transfer program at the community college and enter the four-year college with up to two years of transfer credit.

In addition to curriculum and guidance, our approach includes several other components to provide students with incentives to complete high school and pursue postsecondary study. Technical Advanced Placement (TAP) is the articulation component designed to reduce curriculum overlapping, particularly in occupational subjects. Students who qualify for TAP receive Tri-County Technical College credit which may be used for required courses and/or elective courses in associate degree programs. Technical Advanced Study (TAS) is a relatively new component started by McDuffie High School and Career Center, one of three high schools in Anderson School District Five. TAS allows selected high school seniors to use the twelfth grade as a swing year between high school and college. Students take one or two college courses per term while completing their high school graduation requirements. At the present time, two of the seven PACE school districts offer TAS options as part of their Tech Prep programs.

The "School-to-Work" transitions component of our Tech Prep initiative is also relatively new and is one that we will be expanding in coming years. In this component, students will blend classroom and workplace experiences. We currently have a number of these activities functioning in different schools. For example, Oconee County schools and a few others participate in cooperative activities linking secondary and postsecondary work assignments, and two of our high schools offer community service classes that can provide

important opportunities for students interested in human or public service careers. Other examples of school-to-work transitional activities can include shadowing, internship, or the new youth apprenticeship concept that is gaining popularity across the country.

The Tech Prep initiative in Anderson, Oconee, and Pickens Counties is far from a finished story. While we still have a long way to go before reaching full implementation, we have seen many impacts on both the secondary and postsecondary levels and have learned a great deal about the potential of Tech Prep that we did not anticipate in the beginning.

For example, while the primary focus of our programs has been on helping more high school students prepare for and understand the benefits of community college programs, the Tech Prep initiative actually affects a much wider network of people throughout the community. This impact is evident when considering that materials on Tech Prep, the careers that Tech Prep targets, and other issues associated with the program are networked through students to teachers, parents, siblings, relatives, and many others throughout the community. We understand now that this network is a very powerful communicator of educational opportunities.

Tri-County Technical College has also experienced an increase in enrollment of recent high school graduates which, even in these early stages, can be attributed to the Tech Prep initiative. While Tech Prep is NOT recruiting, it does logically impact college enrollment as the community college is a key provider of the postsecondary component of the Tech Prep curriculum. The program is still too new and too unevenly implemented to know at this point what the full impact will be on the college enrollment.

We have come to understand that Tech Prep is not just a project. It has a beginning, but no end, because both levels of education will continue to change, and as a result, Tech Prep programs will always be evolving. We envision that through Tech Prep there will be a permanent blending of secondary and postsecondary offerings where change at either level will take into account the effect on the other. This will be particularly true for the postsecondary curriculum where any changes in programs or entry-level courses must be articulated with the high schools in order to maintain students' ability to move smoothly from one level of education to the next.

Tech Prep definitely causes changes on the postsecondary level. While some changes may be required almost immediately, others occur later as a result of changes at the

secondary level. At Tri-County Technical College, changes have occurred in college policies to facilitate new articulation agreements, in transcript programs to document TAP credit, in admissions to accommodate students with advanced standing in technical course sequences, in scheduling, and in several other areas. We have also seen an impact in greater interest to pursue new collaborative activities between the high schools and the college, sometimes related directly to the Tech Prep initiative and sometimes in other areas as spin-offs to the initiative.

Last year a study was completed identifying the major areas that Tech Prep impacts on the college so adequate planning could be developed. The study showed fifteen major impact areas including curriculum, faculty issues and advising, student services and other support functions, demands for improved data on program outcomes and reporting, and many others.

Tri-County Technical College has made a considerable investment in the Tech Prep initiative, as have others, but the outcomes at this point and the obvious potential have easily justified the investment. As a community college, with a community-based mission, the Tech Prep initiative provides the College with a mechanism to better respond to educational and economic needs of the tri-county area. Because it is now so comprehensive, Tech Prep relates directly to other institutional priorities such as assessing outcomes, evaluating student competencies, and providing better access for females and minorities.

The Tech Prep initiative in our area represents more than just one type of program. It is actually many initiatives that function under one coordinating structure. Tech Prep is dropout prevention. It is workforce development, a curriculum development and guidance program, and an access and equity initiative providing females and minorities with better access to higher education and rewarding careers. But most of all, we look at Tech Prep as a collaborative process, a long-term investment in the future of students and the economic development of our community and the state.

BUSINESS AND INDUSTRY'S ROLE IN TECH PREP

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America's workplace is changing. The very nature of our work is changing. Technology has affected almost every aspect of the economy transforming the way that we work. Business and industry are involved in global competition. Most countries can successfully compete with the United States today. Business and industry in the United States must have an increased emphasis on product variety, a shortened design to market cycles, customized services, and a centralized decision-making process which in turn requires a better educated workforce.

Changing workplace demands require workers with the ability to retrain rapidly. Retraining will require a more substantial knowledge base in the workforce. Modern machines require smarter employees not only to operate them but also to keep them running efficiently and to configure them for new applications.

The increasing importance of information and service sectors in the United States economy will result in growing needs for postsecondary training. Some of the occupations that are projected to have the greatest number of job openings between 1990 and the year 2000 are registered nurses, licensed practical nurses, maintenance repairpersons, carpenters, cooks, first-line supervisors, electronic technicians, auto service technicians, medical assistants, and electronic technicians. Other fast growing occupations requiring postsecondary education include paralegals, medical assistants, radiology technologists, computer repairpersons, medical records specialists, surgical technicians, physical therapists, electroencephalogram technicians, occupational therapists, and respiratory technicians. As indicated in these projections, a heavy emphasis exists on the medical fields during the 1990s.

The United States is faced with a changing demographic composition of our workforce today. A dramatic increase in the proportion of women, minorities, and immigrants in the population entering the workforce demands that the neglected majority be prepared for opportunities in technical careers. It is expected that seventy-five percent to

eighty percent of the new entrants in the labor market between now and the year 2000 will be women, minorities, and immigrants.

Why is Tech Prep important to business and industry? Business and industry can assist in directing Tech Prep program development by conducting thorough internal analyses of workforce preparedness needs, communicating workforce preparedness needs to educators, serving on steering committees, and serving on articulation committees. Business and industry can facilitate workplace relevance in Tech Prep by also sharing scientists and engineers with schools.

Today in Wilmington, North Carolina, we have a two-way interactive video program between the university, community college, high school, and hospital. This interaction is opening up a whole new world to education. It may be the mechanism to offer education across all rural areas in the future.

Opportunities for cooperative educational placement need to be provided. For example, in our area, R. J. Reynolds Nabisco is funding the Tech Prep consortium. Reynolds is supporting college foundations to assist in buying instructional equipment. Business and industry can also serve as a public advocacy to (1) recognize workforce preparedness needs, (2) incorporate workforce preparedness into the curriculum, (3) insist on academic rigor, and (4) leverage government support for Tech Prep.

Business and industry can exert influence in support of continuous federal appropriations under the Perkins Vocational Act of 1990 and state grants for workforce preparedness in Tech Prep planning. In North Carolina $10 million has been allocated for workforce preparedness in Tech Prep planning this year. Business and industry can encourage local government to continue to assist in funding the Tech Prep programs.

Mandatory course requirements for graduation of high school have just been increased in North Carolina. Additional science and algebra have been added as mandatory course requirements.

Strategies for developing business and industry involvement in Tech Prep include (1) asking business and industry leaders to make a keynote speech at every Tech Prep conference; (2) asking business and industry to fund specific projects (i.e., new nursing

equipment, computers, electronic equipment); (3) asking business and industry leaders to provide curriculum guidance to upgrade vocational technical courses in textiles, drafting, computerized accounting, robotics, and nursing; (4) asking business and industry leaders to chair steering committees, articulation committees, and fund-raising committees; and (5) asking business and industry leaders to help lobby legislators, governors, boards of education, and county commissioners to support Tech Prep with appropriate policies and funding. In addition, business and industry needs to strive and encourage accountability of proficiency testing and competency tracking.

We, in North Carolina, are proud of our Tech Prep program which began in 1987 in Richmond County. Since 1987 the SAT scores in Richmond County school system have increased by forty-seven points. The percentage of students attending two- or four-year colleges has increased from forty-eight percent to seventy-six percent, and our high school drop-out rate has dropped from 7.2% to 4.8%. Tech Prep works, and we in business and industry are anxious to help it work.

FACTORS INFLUENCING TECH PREP PLANNING AND IMPLEMENTATION

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"Tech Prep represents an opportunity for change." "It is a path to educational reform and renewed relationships between education and business, industry, and labor." These are the kinds of statements we are hearing as we conduct research related to Tech Prep. It is an exciting time for educators, and it is a particularly exciting time to be an educational researcher. I feel very privileged to share research findings on Tech Prep conducted by the National Center for Research in Vocational Education (NCRVE).

PRESENTATION OUTLINE

My goal today is to describe planning strategies used by consortium sites across the country to develop Tech Prep under the new Perkins legislation. Yes, we recognize that it is early to declare any approaches successful. However, my goal is to share observations of individuals involved with Tech Prep to help you get started with or refine your existing Tech Prep programs.

Our two-year study of Tech Prep at the University of Illinois is only one of several sponsored by NCRVE to facilitate knowledge about Tech Prep. The initial phase of our research focuses on (1) state and local planning and implementation processes, (2) leadership roles and responsibilities, and (3) strategies to overcome barriers.

My presentation today focuses on five strategies that can be undertaken in planning Tech Prep. These are (1) gaining top leadership commitment, (2) establishing a local philosophy and vision, (3) securing strong project leadership, (4) recruiting key groups, and (5) adopting a team planning approach. I will discuss each of these strategies briefly.

Gaining Top Leadership Commitment

To ensure that Tech Prep gets off on sound footing and has long-term support, it is essential to gain commitment from top leaders; and I am not just referring to educational leaders. Of course, commitment to the Tech Prep concept is important from state and local leaders of schools and colleges, but it is also important from business, industry, and labor; community organizations; parents; and other key groups who have a stake in educating our future workforce. Some ways a top leader shows commitment is involvement (1) in developing the local philosophy and vision for Tech Prep; (2) in committing of personal time and energy and speaking about Tech Prep, especially with leaders of other key groups in the community and across the state; (3) in instilling enthusiasm to get others excited about the idea; (4) in coaching staff and supporting their involvement in the program; (5) in ensuring that resources are available, especially in providing people with the time needed to participate in planning in the beginning stages; and (6) in rewarding accomplishments in ways that are meaningful to individual staff.

Establishing a Local Philosophy and Vision

Several individuals participating in our research spoke of the importance of adopting a local philosophy about Tech Prep and clarifying how federal and state definitions are to be used at the local level. These individuals had thought strategically about how Tech Prep could be used to improve educational opportunities for students. By stating their goals specifically, these individuals felt they were able to provide more direction to their projects.

We observed that when the local philosophy was developed collaboratively, there seemed to be greater commitment to Tech Prep and to conducting a systematic planning approach for it. Some important questions to ask when formulating a local Tech Prep philosophy are (1) What is the purpose of Tech Prep? (2) Who should be involved in it? (3) What outcomes should be achieved? and (4) How should planning be conducted?

Securing Strong Project Leadership

Part of our research focuses on learning about the skills and knowledge necessary for leading a Tech Prep project, and we see four areas emerging. First, it is important for a project leader to have expertise in the field of education in such areas as curriculum development, articulation and integration, and program planning and evaluation.

Second, we observed the need for Tech Prep project leaders to understand the process of change and be able to facilitate educational change. Third, we are learning that Tech Prep project leaders must be masters in facilitating teamwork, especially for planning purposes. Finally, we are seeing the need for highly refined skills in project management, especially skills in organizing, prioritizing, and problem solving.

Recruiting Key Groups

Inviting key groups who have a stake in the development and implementation of Tech Prep has several benefits. It results in shared ownership. It also helps prepare people for change—an inevitable consequence of Tech Prep. We were advised that it is important to select those individuals and groups directly impacted by Tech Prep and likely to commit to ensuring its success. Some of the key groups are (1) secondary and postsecondary vocational and academic faculty who can play a role in designing curriculum; (2) administrators who can share the local philosophy; (3) business/industry/labor representatives who can assist in designing relevant curriculum and work experiences, as well as providing employment opportunities; (4) guidance counselors who can counsel students and parents about Tech Prep options; (5) university faculty who can help prepare future teachers and educate leaders in Tech Prep, and (6) students who can share expectations and career aspirations to help make the programs relevant.

Adopting a Team Planning Approach

Let me point out first of all that the team approach we have seen used in Tech Prep sites is much different from the advisory committee approach. These teams involve representatives of the key groups in active, on-going planning activities. They are involved in designing almost every aspect of Tech Prep, from marketing to evaluation. However, if

there is a common place where teams are involved at most of the sites we have studied, it is in designing articulated and integrated curriculum.

These teams typically carry out a number of tasks including (1) reviewing and pilot testing applied academic materials, (2) modifying existing curriculum, and (3) designing new courses and instructional approaches to enhance the integration of vocational and academic content.

We asked individuals who have participated in planning teams for ideas about how to develop the tasks effectively. They suggested (1) gaining commitment and needed resources from top leaders, (2) formalizing the team planning agenda and procedures through regularly scheduled team meetings and establishing ground rules, and (3) training in team planning approaches as part of total staff development. I would like to add a few comments on this topic because I believe it is so important to the eventual success of Tech Prep. It is essential to develop the skills of *all* those involved in the Tech Prep project early on and throughout the planning and implementation phases. In order to do this, staff development cannot be viewed as an add-on. Time is too precious! It must be approached in a learning by doing fashion—much the way we propose involving students in Tech Prep.

Some other team development strategies suggested are (1) providing ample opportunity to practice team planning; (2) observing other planning teams in action—even those of other consortium sites; (3) monitoring team planning and intervening when teams get bogged down; and (4) celebrating team accomplishments at key milestones in the project, such as the end of the planning phase or when students first enroll in the program.

SUMMARY

These findings suggest that specific planning strategies can be employed to develop Tech Prep. The challenge we face at the National Center is in determining the ways Tech Prep contributes to educational reform and in providing you with the resources and information you need to implement the programs successfully.